

Critical Success Factors of Open Government and Open Data at Local Government Level in Indonesia

by Djoko Sayogo

Submission date: 21-Mar-2019 01:32AM (UTC-0700)

Submission ID: 1097127809

File name: ernment_and_Open_Data_at_Local_Government_Level_in_Indonesia.pdf (582.19K)

Word count: 9333

Character count: 53705

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Critical Success Factors of Open Government and Open Data at Local Government Level in Indonesia

Djoko Sigit Sayogo, University of Muhammadiyah Malang, Malang, Indonesia

Sri Budi Cantika Yuli, University of Muhammadiyah Malang, Malang, Indonesia

ABSTRACT

This article explores the complexity of open government and open data implementation from the perspective of local government in developing countries by addressing the challenges, success factors, lesson learned and the indicators of success. Using focus group discussions and in-depth interviews with public managers and other actors at the Bojonegoro regency, this study found five major challenges to open government and data, namely: a) the misappropriation and misused of the data, b) limitedness of technological capabilities, c) ensuring data credibility, d) the availability of information policy to govern openness, and e) maintaining public involvement and enthusiasm. The authors also identified four critical success factors driving the success of open government and data: a) collaboration between government, academics, private entities and general public, b) the openness of government office to accept criticism and suggestion, c) the accommodating leaders, and d) the commitment of government agencies to engage in open government and open data.

KEYWORDS

Challenges, Critical Success Factors, Indonesia, Local Government, Open Data, Open Government

1. INTRODUCTION

A smarter governance structure, facilitated by the advancement of information and communication technology, is necessary to benefit from the enormous capability of the public to congregate, interact, and collaborate in finding solutions to intricate and complex social problems (Scholl & Scholl, 2014). For the government, the key to enabling such structure is embracing the open and shared information culture in managing their data and information (Dawes, 1996). Open government and open data initiatives received prevalent attention in the last decade especially in developed countries where the initiatives are deemed to encourage innovations, new business models, and economic development (Huijboom & Van den Broek, 2011). Using open government and open data, the government, private entities and general public are able to work collaboratively to learn and generate novel public innovation to solve complex social problems based on published data (Evan & Campos, 2013). For instance,

DOI: 10.4018/IJEGR.2018040103

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eToilet apps in Chennai combine public toilet data and GPS (global positioning satellite) to solve public sanitation issues in India (Raman, 2012).

Notwithstanding the benefits, the implementation of open government and data is associated with numerous challenges including: sharing capability, privacy issues, data standardization, and political and financial barriers (Chui & Farrell, 2014). Government agencies are also challenged by related technical and organizational problems (Janssen et al., 2012) including violations of privacy, misuse of data, and misinterpretation of data (Zuiderwijk & Janssen, 2014). There are also challenges from the user's perspective, including difficulties in processing data, lack of access, and fragmentation of data (Zuiderwijk, Jeffrey & Janssen, 2012). The interest to adopt open government and open data is not only prevalent in developed countries but also in the developing countries such as: Kenya, Ghana, and Nigeria. While open government and open data implementation in the developed countries are met with numerous challenges, one can argue that these challenges can be more acute in the developing countries. Sayogo, Pardo & Cook (2014) found that countries have different levels of open data development in terms of content, data manipulation capabilities, and participation capabilities depending on their national contexts.

Government's interest in adopting open government and open data is not only manifesting at the national level, but also at the local level. For instance, more than 500 cities adopted open data model in one form or another on their websites (Yavuz & Welch, 2014). As such, the challenges to adopt and implement open government and open data are more prevalent in local governments where capabilities and resources are lacking compared to the National government. Agencies within local government must have the capability to share data and information both technically and organizationally (Melin, 2016; Janssen et al., 2014). Lacking the capabilities have resulted in immature efforts and publishing data was just used as a front to improve the image and increase the legitimacy of local government (Yavuz & Welch, 2014, p. 582).

Presumably, the above-mentioned challenges are more profound in local governments in developing countries compared to those in developed countries. Nevertheless, ascertaining whether the assertion is correct is not easy given the limited number of studies focusing on local government level in the context of developing countries. For that reason, the purpose of this paper is to critically analyze the implementation of open government and open data initiatives at the level of local government in Indonesia focusing on the challenges, success factors and lessons learned, as well as the strategies used to mitigate the challenges. In addition, this paper aims to evaluate the characterization of success of open government and open data from the perspective of local government in developing countries. Hence, this study addressed the following research questions: a) what are the challenges facing local government in developing countries to implement open government and open data? b) what lessons and success factors can be learned from the situated local government case in the developing countries? and c) what characterized the success of open government and open data implementation at local government in developing countries?

This paper focuses on the supply side of open government and open data, meaning that we investigate factors that affect the implementation of open government and open data from government's perspective, particularly that of local governments. This paper follows the Obama's three pillars of open government – transparency, participation, and collaboration - to center our arguments. However, in conjunction to Sayogo, Pardo & Cook (2014), we acknowledge that the development of open government and open data in developing countries follows incremental approaches comparable to the e-government development stages. Furthermore, we argue that open government and open data are closely related because open data is one of the tools to realize open government (Gonzalez-zapata & Heeks, 2015; Janssen et al., 2012; Yu & Robinson, 2011). Thus, we focus only on the challenges and critical factors that encompass both open government and open data.

The remainder of this paper is organized in the following manner: Section two will introduce previous studies on open government and open data focusing on the challenges and lesson learned. The research methods will be described in section three. Section four will discuss the results and

findings based on empirical data obtained through focus group discussion and in-depth interviews. Finally, section five will provide the discussion and concluding remarks, followed by implications and limitations.

2. CHALLENGES OF AND LESSONS LEARNED FROM THE IMPLEMENTATION OF OPEN GOVERNMENT AND OPEN DATA

Transparency was the initial core component of open government (Tauberer, 2014), the Obama's Open Government Memorandum in 2009 added participation and collaboration as the cornerstone of open government along with transparency (Obama, 2009). The concept of open government originates from the believe that decision-making and actions of government must be made more transparent and participative (Meijer, Curtin & Hillebrandt, 2012). As succinctly argued by Bannister & Connolly (2011), transparency would lead to accountability since it is easier to hold a party accountable when their actions and decisions are being made transparent. The focus of open government is primarily on how to generate ways to empower citizens individually or in collaboration with private entities and non-governmental organizations through the openness in government (Lathrop & Ruma, 2010). Since then, later studies add and expand the cornerstone of open government to include other components, for instance, Abu-Shanab (2015) added empowerment and accountability as part of the components.

On the other hand, at the very beginning of open government movement in the 1950s, transparency was the fundamental element of open government (Tauberer, 2014). As such, the implementation of open government is then initiated by opening data owned and collected by the government which is generally called open data (Gonzalez-zapata & Heeks, 2015). Open data refers to the efforts where governments make all data collected and stored by them open and accessible to the general public through data portal when mandated by the Law (Sayogo et al., 2014; Geiger & von Lucke, 2012).

The implementations of open government and open data face various challenges and are affected by a set of critical factors to ensure success. Zuiderwijk, Janssen & Choenni (2012) and Zuiderwijk & Janssen (2014) classify the challenges and barriers into four categories: a) political, economic, social and technical challenges, b) data access challenge, c) data disposition challenge, and d) data usage challenge. In general, challenges and critical success factors of open government and open data implementation can be analyzed from three perspectives, namely: a) the perspective of data publication, b) the perspective of data usage, and c) the perspective of platform supporting open data (Zuiderwijk et al., 2012; Zuiderwijk & Janssen, 2014). Identifying challenges facing a global data sharing repository, Sayogo & pardo (2013) found two major determinants of success, namely: a) data management and institutional support, and b) recognition and acknowledgement for the data owner/steward.

Furthermore, it is plausible to argue that the bedrock to enable open government and open data lies on the open and shared information culture (Dawes et al., 2009). Thus, open government and open data are closely related to the capability of government to share and integrate data (Yang, Lo & Siang, 2015). Yang et al. (2015) further argue that open government and open data is based upon cross-boundary information sharing among agencies. Hence, it is valid to argue that the challenges in open government and open data mimics the challenges found in cross-boundary information sharing (Yang et al., 2015). Considering that studies on the development of information technologies in government required comprehensive understanding of the socio-technical factors (Andersen & Dawes, 1991; Gil-Garcia et al., 2010; Yang and Maxwell, 2011), then the challenges of open government and open data (Table 2) should be seen from the same perspectives. Andersen & Dawes (1991) further classify the determinants into three inter-related categories of technology, organization and policy.

Compatibility and interoperability are two major technological concerns for sharing data. These two concerns bring up the challenges of standard development, platform and application interoperability, metadata, and use of algorithms to ensure sharing (Bekkers, 2009; Ferro & Sorrentino, 2010; Gil-Garcia & Pardo, 2005; McDermott, 2010; Murray & Hsieh, 2008). In addition, concerns

with information security (Yang & Wu, 2013) and privacy (Zuiderwijk et al., 2014; Yang et al., 2015) pose major challenges in embracing and implementing data sharing and openness. Data management in terms of data cleaning, organizing and redacting to ensure the quality of the data present other technical challenges in implementing open government and open data (Janssen et al., 2012).

From the organizational perspective, funding is a major challenge. In fact, sharing and openness initiatives could fail due to lack of funding and financial resources. Financial resources are needed to initiate and sustain collaboration underlying many data sharing and openness projects (Gharawi & Dawes, 2010). Thus, differences in organizational resources significantly influence the working collaboration to support data sharing and openness project. In addition, leadership is the key in furthering the progress of data sharing and openness projects (Demercivi, Thompson & Bodor, 2004; Eglene & Dawes, 2007; Eglene, Dawes & Schneider, 2003; Gil-Garcia, Pardo & Burke, 2010). Positive supports, attention, and active participations of top leaders are significantly enabling the success of data sharing (Jarvenpaa & Ives, 1991; Murray & Hsieh, 2008; Reddick & Frank, 2007).

Laws, regulations and policies constitute the basic elements for the success of data sharing (Landsbergen & Wolken, 1998; Dawes, 1996). Laws, regulations and policies provide institutional legitimacy for the collaborators in the multi-organizational data sharing projects. Regulations and policies strengthen the authority and relationships among those collaborating for data sharing project (Dawes & Prefontaine, 2003). The challenges often reside in the multiplicity of policies and regulations at various levels of government governing the implementation data sharing and usage of data (Zuiderwijk & Janssen, 2014).

3. RESEARCH METHODS AND DESCRIPTION OF THE CASE

3.1. Research Methods

This study was conducted as a case study encompassing documentation analysis, focus group discussion, and in-depth semi-structured interviews. The interviews addressed critical factors, challenges, and lesson learned involved in implementing open government and open data at the local government level in Indonesia. For this group discussion and in-depth interviews, with public managers and other actors involved in implementation of open government and open data at the Regency of Bojonegoro, Indonesia, were conducted to gather the data. Among the different actors and respondents interviewed are: a) open data project leader and coordinator from four agencies, b) non-governmental organizations, c) consultant, and d) academics.

All interviews were recorded and transcribed in whole to obtain dense empirical data. Interviews were transcribed and analyzed following an inductive logic and using grounded theory techniques (Strauss & Corbin, 1997; 1998). The analytical processes were conducted by the research team and were performed iteratively. The interview transcripts were analyzed by each team member and then discussed in group resulting in inductive coding themes of open government and open data challenges, lesson learned and critical success factors. The resulting constructs were then contrasted with previous studies used as a theoretical lens.

3.2. Description of the Case

The initial initiative of open government and open data in Indonesia began with the enactment of the Law no. 14 of 2008. The concrete first step of Indonesian government with regards to open government and open data was the participation in the Open Government Partnership in 2011. In the open government action plan of 2014/2015, Indonesia promoted two major commitments, namely: a) the open data portal (data.go.id) as the manifestation of Law no. 14/2008 and b) LAPOR! (REPORT!), a web and mobile application for the public to present their grievance over government policies as the implementation of Law no. 25 of 2009 on public services (OGI, n.d.). The development of open government and open data in Indonesia was initiated and prepared by the collaboration of four major

players, namely: UKP4¹, Bandung Institute of Technology (ITB), Sinergantara (non-government organization), and the Regency of Bojonegoro. At the very beginning, the Regency of Bojonegoro was actively involved as the pilot project for the implementation of open government and open data in Indonesia.

The Regency of Bojonegoro has started to adopt the open government principles since March 2008. Their initial efforts to promote openness in government started with a program called “Sobo Pendopo”. This is a public hearing and interactive dialog program conducted every Friday afternoon at around 2 PM to provide a forum for the public to convey their opinions, ideas, critiques, and input to government agencies within the Regency of Bojonegoro (Adarrma, 2017). The Regent and his staff directly respond to demands from the public by taking specific actions to amend the grievances. As the program progresses, the Regency of Bojonegoro subsequently extends their openness efforts by adding an interactive public radio dialog called “Radio Malowopati Madani”.

In July 2014, the Regency of Bojonegoro developed two web applications called “Integrated Public Aspiration Systems (SIAP)” and “Public Aspiration Online Services (LAPOR!)” for the public to express their opinions, ideas, critiques, and input to local government agencies (Heriyanto, 2017). The Regency also developed SMS (Short Messaging) based online reporting system to expand the reach of the public dialog program. The grievances submitted through SMS will be transmitted to the above-mentioned SIAP and LAPOR!. Agencies that receive complaints related to their services have five working days to respond to and act on the complaints. An agency will receive a red flag for every failure to respond to and act on a complaint within five working days. A yellow flag will be received if the complaints are responded but no action is taken within five working days. For instance, an agency responds to a complaint about road maintenance but it takes the agency more than five days to repair the road. Finally, a blue flag is given for a response and action within five working days. From January to May 2016, the Regency received in average 70 – 300 complaints monthly (Heriyanto, 2017). In 2017, the systems were extended to reach every villages within the Regency of Bojonegoro.

4. RESULTS AND FINDINGS

This paper presents the preliminary efforts to critically analyze and connect the challenges, critical success factors and strategies in the implementation of open government and open data initiatives at the local government level in Indonesia. The result section is organized into four sub-sections to present the linkage between the challenges, critical success factors, and strategies in implementing open government and open data. In the first sub-section, we discuss what constitutes a success in the implementation of open government and open data from the subjective perception of the FGD participants and interviewees. These represent the indicator of success from the perceptions of the developer, the supplier side. Subsequently, the second sub-section details the challenges facing the Regency of Bojonegoro in implementing open government and open data. It is followed by the discussion of the critical success factors and lesson learned from open government and open data in Indonesia in the third section. Finally, the fourth sub-section outlines the strategies used to manage the challenges by taking into account the critical success factors.

4.1. The Indicators of Open Government and Data Success from the Perspectives of Local Government in Indonesia

We asked the 12 D participants and interviewees to specify their perceptions of the indication of success in the open government and open data implementation in the Regency of Bojonegoro. We measured the construct of success from the subjective perceptions of the participants of FGD and the interviewees. Given that the majority of the participants and interviewees are public managers from agencies in the local government, the indicator of success presented in this paper represents the supply-side of open government and open data. As such, following the four perspectives of open government

stakeholder's framework proposed by Gonzales-Zapata & Heeks (2015), this paper specifically focuses on evaluating success from the bureaucratic perspective and technology perspective.

The FGD participants and interviewees identify nineteen (19) indicators that we subsequently divided them into six (6) categories based on the similarity of meanings among the indicators, namely: a) acknowledgment and recognition, b) financial accountability, c) public values in terms of social, economic and culture, d) trust, e) compliance to policy requirements, and f) technology. Participants and interviewees perceive success indicators ranging from a very broad perspective such as reduction of poverty to a narrow perspective of mere fulfillment of government policies and mandates. Some of the interviewees indicate that open government and open data success was nothing more than just to fulfill the mandate and policy requirements. On the other hand, other participants and interviewees perceived that open government and open data success can also be measured in terms of the provision of public values. As the case of The Regency of Bojonegoro indicates, the openness in government increases public values ranging from improved public services to the reduction of corruption and poverty.

Many of the participants mentioned that receiving recognition and acknowledgment from other regions, national and international, indicates their success in implementing the open government and open data. According to one of the interviewees from the budget and planning agency, it is not easy for them to actually assess the success of the program by themselves. The interviewee stated, "...with OG initiatives, many regencies visit us and [want to] learn from us... Honestly, we are astonished. We thought we were only doing our job, just like this... But people come to us...." As such, the local agencies measured success by the recognition of other regencies, which visit and learn from them.

The interviewees from budget and planning agencies also pointed to financial accountability as the indicator of their success. With open government and open data, budget planning and usage are now on target and decided based on performance, thus increasing their accountability. The participants and interviewees also regarded the increase of trust between government and the general public through the facilitation of open government and open data as the indicator of success. As interviewees argued, open government and open data include the interactive forum reduces the gap between government and the public, which then increases public trust toward government. The participants and interviewees also pointed to the set of technological success indicators of open government and open data. In terms of the technology, success indicators mostly related to the availability of medium to disseminate information and the ease of data access enabled by the implementation of open government and open data. According to the interviewees, direct measure of open government and open data success can be determined by the number of critiques and complaints from the public, which increased from 20 - 70 in 2014 to 70 - 300 in 2016 (Heriyanto, 2017).

4.2. Challenges of Open Government and Open Data Implementation in Indonesia

The results from focus group discussion and in-depth interviews with the open government taskforce from the Regency of Bojonegoro indicated a set of challenges facing public managers in planning and implementing open government and open data. We put the challenges into four (4) categories as shown in Table 1. The four categories are challenges to government policy, challenges to the organization of the initiatives and the agencies, challenges related to the technology, and challenges in encouraging participation.

Most of the participants and interviewees stated that the challenges related to data management are most crucial given that most of the operating units are struggling with data inventory. This is especially critical at the village level where the process of collecting data is not equipped with data archiving; this eventually affects the quality of the data. At the same time, the participants and interviewees also pointed to the lack of feedback mechanisms between the local government agencies and public. This issue led to two major challenges for the agencies. First, there is a concern that the data and information given to the requester will be misused or misinterpreted. Second, agencies lose the opportunity to utilize the feedback to improve their public services in term of providing information.

Table 1. Indicators of open government and open data success in Indonesia

Category	Indicator of Success
Acknowledgment & Recognition	<ul style="list-style-type: none"> • Recognition from other regions regarding the achievement of the Regency of Bojonegoro. • Accomplishment of local, national and international awards and recognitions in terms of openness
Financial Accountability	<ul style="list-style-type: none"> • Budget is allocated and used according to performance and target in terms of infrastructure, health, and education
Public Values (Social, Economy & Culture)	<ul style="list-style-type: none"> • The decrease in the number of corruption cases • The decrease in the number of poverty, manifested in 2016 in which The Regency of Bojonegoro no longer fall within the 10 poorest districts in East Java • The public becomes more critical towards government's actions and public services • Influx of investment is increasing in the region • The quality of public services is increasing • The involvement of various elements in the implementation of open government and open data
Trust	<ul style="list-style-type: none"> • Increase of public trust to the local government • Increase of satisfaction toward government and public services
Fulfillment of Policy requirements	<ul style="list-style-type: none"> • Fulfilling the mandate in accordance to the Law of Public Information Openness • Realizing the open data as specified in the OGP action plan, such as homeless data
Technology	<ul style="list-style-type: none"> • More and more data is accessible to the public • Many villages are now using ICTs to manage their budgets • Information requests, critiques, and public aspirations are increasing from the public • The variety of medium to disseminate and receive information and data • Interaction and communication between public and government are now easier • Have developed tools that ease the interaction between public and government

Finally, the information and data typically flow in one direction. Many of the interviewees expressed their concerns about the possibility that the requester of information actually finds mistakes or inaccuracy in the data but decides not to report it or, even worse, the requester ignores it and making decision based on it.

Almost all of the interviewees and FGD participants called attention to the classical challenge of access to information and communication technologies (ICTs), particularly in the rural areas. As stated by some interviewees, the agencies, particularly at the lowest level, have not yet achieve an adequate level of preparedness in term of the technology. It is evident in the obstruction of data inventory and collection due to the lack of access to the ICTs. The issue is further compounded by the lack of capabilities among the agencies' personnel in utilizing ICTs.

Furthermore, the efforts to implement open government and data are also challenged by the deliberate process in developing regulations and policies to regulate the implementation of open government and data. On top of that, the existing policies and regulations are not in sync with all of the necessary activities to implement open government and data. Very often, the activities to implement open government and data exceed the scope of the existing regulations and policies, thus inhibiting the efforts of the team and the local agencies.

The FGD participants and some of the interviewees also stated very interesting organizational challenges related to organizational culture and workload. Many of the personnel in the local agencies felt that openness of data and information is additional workload that they have to bear. Only very few of the personnel considered the openness is the integral part of their work and that openness is the necessary future requirements of governance. This issue, according to the interviewees, indicates the challenge of commitment of the personnel in local agencies to support open government and open data initiatives.

Table 2. Challenges of open government and data in Indonesia

Category	Description of Challenges
Policy	<ul style="list-style-type: none"> • The existing regulation is not adequate to govern open government and data because the requirements for open government and data exceed the existing regulation. • The preparedness of the team in developing the Regent's policy related with the Openness of Information (Law of 14/2008) • The development and enactment of local regulations to regulate openness took a long process and time, inhibiting the team efforts to quicken the adoption of open government and data.
Organization	<ul style="list-style-type: none"> • Inventorying data is not complemented with appropriate documentation and procedure • The unpreparedness of the lowest level unit (e.g. at village level) to develop the structure to support open government and data. For instance, the village is having difficulties to establish the Office of Information & Documentation Management. • Not all local government agencies have the same frame of reference regarding the purposes, objectives and vision of openness for the Regency. • The commitment of all local government agencies to respond to and act upon the input and critiques from the general public as part of information openness. • Fear that certain irresponsible parties will misuse the information openness in the regency. • Many personnel still regard open government and data as additional burden to do on top of their regular activities • Budget cut undermine the actions that the local agencies has planned since the beginning of the financial year
Technology	<ul style="list-style-type: none"> • Delays from each unit to submit their technological requirements hamper the efforts to implement open government and data. For instance, many villages are unhurried to apply for website domains to the IT department to support the IT-based village and openness in the village. • Web activation, particularly in remote areas, is constrained by the geographical coverage and areas • Problem with data inventory • Many personnel at the local level have limited capabilities related to information and communication technologies. • Data input very often late due to the geographic location and the Internet coverage
Participation	<ul style="list-style-type: none"> • The diverse interests and needs of general public to give input and critiques in the public consultation forums • Very often, the applicant of information did not provide feedback to the government after receiving the data. • The public participation particularly at the village level is unequal depending on capabilities of the human resources and the geographic location of the village • Some people are still reluctant or afraid to freely convey their aspirations or complaints for fear of the repercussions of their actions. • Lack of socialization and public awareness campaign to encourage the general public to access information or to freely convey their grievances to the government agencies in every level, from the village to the Regency.

4.3. Critical Success Factors of and Lessons Learned From Opening Government and Data in Local Governments in Indonesia

The results from focus group discussion and interviews indicate five (5) critical success factors driving the successful implementation of open government and open data in the Regency of Bojonegoro, Indonesia (Table 4). The first factor is good collaboration between government, private entities, academics, and general public. From the get-go, the Regency of Bojonegoro has openly welcomed private entities, academics, and the general public to get involved in the planning, monitoring, implementation, and evaluation of the open government and open data. For instance, the regency includes Bandung Institute of Technology (ITB), Sinergantara, and Bojonegoro institute from the start of the program. The relationship built from the beginning induces the development of trust early in the collaboration. According to the interviewees, the involvement of external partners from the start has minimized conflicts and helped the government to stay in course during the implementation. As

one of the interviewees stated, “So... it is precisely that [we include] NGOs to help controlling us... just like “devil advocate” but still for the benefit of us all... [interviewees from the IT department]”

Active participation of general public is regarded as the second critical success factor by the FGD participants and interviewees. As pointed out by the interviewees, the general public is actively involved in the planning of open government and open data from the very beginning in The Regency of Bojonegoro. They then actively involved themselves in monitoring the implementation of the program. According to the interviewees, the goodwill of the government to involve the public engendered the development of public trust that is necessary to support the government’s efforts in carrying out open government and open data activities.

The willingness of the local government agencies to accept critiques and input proved to be the third critical factor according to the FGD participants and the interviewees. From the beginning the Regent as the leader has raised the importance of critiques and input as part of the governance in The Regency of Bojonegoro to all local agencies by organizing a face-to-face forum called “Sobo Pendopo” since March 2008. The forum was then extended to online format in July 2014 and has been further extended to reach every village within the jurisdiction of the Regency of Bojonegoro since 2016. In relation, the commitment of a leader is the fourth critical factor in The Regency of Bojonegoro. According to the interviewees, it was the commitment and efforts of the Regent as the highest leader in the regency that initiated the idea of openness and then it is also the regent who relentlessly encourages and motivates all public managers in The Regency of Bojonegoro to embrace openness. Due to the example from the Regent, the public managers as the functional leaders of the local agencies are more open in accommodating the creativity of their staff in planning and implementing open government and open data. Finally, the acceptance of openness vision by every personnel in each local agency is a critical success for the implementation of open government and open data. According to the interviewees, the acceptance of openness vision, which includes accountable financial management, increased personnel’s motivation and reduced resistance in the planning, implementation and evaluation of open government and open data in The Regency of Bojonegoro.

We also identified four primary lessons learned based on the focus group discussion and interview results (Table 5). These four primary lessons are: a) commitment from the highest leader, the regent, gives confidence to public managers and staffs to pursue openness, b) stakeholder’s needs must be considered in developing and implementing open government and open data, c) active involvement of the general public promotes higher motivation for the agency’s personnel to implement open government and data, and d) training on ICTs should not only focus on the level of operators but also on the level of managers to maintain public managers’ support for and interest in staff activities.

4.4. The Strategies for Implementing Open Government and Open Data in Indonesia

With regards to the 12 challenges, we asked the FGD participants and interviewees to state the strategies undertaken by the open government and open data taskforce in The Regency of Bojonegoro to manage the challenges. They identified sixteen (16) strategies they applied to overcome the challenges. The details are presented in Table 3. We then categorized the strategies into six (6) major groups. The first

Table 3. Critical success factors of open government and data in Indonesia

No.	Critical Success Factors
1	Good collaboration between government, private entities, academics, and the public
2	Active participation of general public in each step of the efforts to implement open government and data
3	The willingness of the local government agencies to accept critiques and input
4	Commitment of the leader and a leader that accommodate the creativity of the staff
5	The acceptance of open government and data vision by each agency in the local government level

Table 4. Lesson learned from the open government and open data in Indonesia

No.	Lesson Learned
1	Commitment from the highest leader, the regent, gives confidence to public managers and staffs to pursue openness
2	Stakeholder's needs must be considered in the development and implementation
3	Active involvement of general public increases the motivation of the agency's personnel to implement open government and data
4	Trainings on ICTs should not only focus on the operator level but also on the managerial level

Table 5. Strategies to manage the challenges of open government and data in Indonesia

Category	Strategies
Participation and Collaboration	<ul style="list-style-type: none"> • Engaging stakeholders from the very start • Organizing an interactive dialog and forum that is not burdening the public to get involved • Forming the public consultation forum to mediate the relationship between public and government to shorten the communication distance between government and public.
Socialization Strategy	<ul style="list-style-type: none"> • Organizing festivals and contests to accelerate the acceptance from the public • Conducting awareness campaigns on how to access information and utilize the benefits of open government and open data
Enactment of Regulation and Policies	<ul style="list-style-type: none"> • Enacting regulation in the form of regent's instructions or regulations • Creating awareness of the existing regulations governing the dissemination of information
Recruitment and Training for agency's personnel	<ul style="list-style-type: none"> • Recruiting contract worker with appropriate qualifications, particularly in terms of ICTs, as oppose to recruiting volunteer workers. • Improving trainings for "community empowerment cadre (PKM)" to increase the active roles of the public • Conducting capacity strengthening program with regards to open government and open data.
Creating systems and procedures to support the use of open government and open data	<ul style="list-style-type: none"> • Conducting direct assistance to the staff at the village to support open government and open data • Exercising strict procedures in term of information request and information dissemination, such as asking for detail explanation of the data or information uses • Requesting feedback to every information or data requester and add red flag to the requester if feedback is not given. The flagging system as used for the consideration in fulfilling future data or information request. • Continuous monitoring and evaluation particularly to the lowest units in the regency (the village government)
Information and Communication Technologies	<ul style="list-style-type: none"> • Optimizing the village web domain registration and activation of the domain • Strengthening IT hardware and equipment at the village level

is participation and collaboration in terms of engaging stakeholders from the get-go and constructing a forum that made it easier for the public to enter and engage in the system. The second strategy is creating socialization plans through festivals, contests or campaigns to raise public awareness of the open government and open data initiatives. The third is enacting regulation and policies to support the efforts to implement open government and open data. Strengthening capacity by training agency's personnel and selected members of the public and targeted recruitment is the fourth strategy. The training was also aimed at selected people, non-agency personnel that will serve as the "community empowerment cadre" to help increase the active roles of general public. The fifth strategy is by creating systems and procedures to support the use and implementation of open government and open data. Finally, their sixth strategy is to strengthen the ICTs capability and capacity at every level of the government.

5. DISCUSSION AND CONCLUDING REMARKS

This study uses a case study methodology encompassing documentation analysis, focus group discussion, and in-depth semi-structured interviews to address critical factors affecting the implementation of open government and open data initiatives at the local government level in Indonesia focusing on the challenges, success factors and lesson learned. Furthermore, this paper measured the construct of success from the subjective perceptions of the participants of FGD and the interviewees.

5.1. Discussion

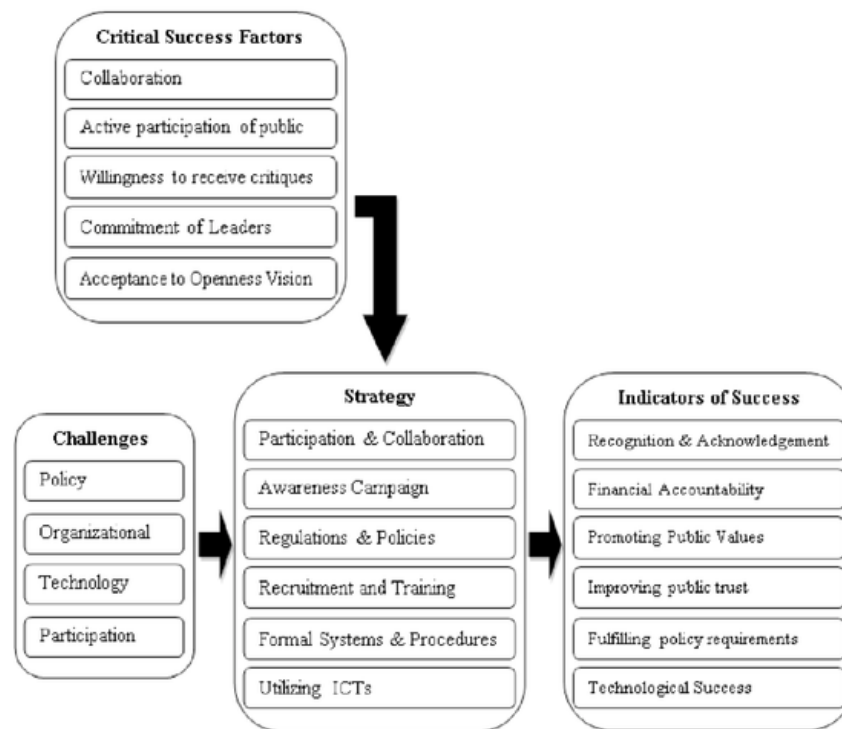
Many of the challenges, success factors and lessons learned identified from the case of local government in developing countries are not that different from those described in previous studies conducted in the developed countries. Thus, as argued by Melin (2016), the challenges, success factors and lessons learned seem to have a pattern not associated with national contexts or governmental level. Nonetheless, while many of the challenges, lesson learned, and success factors identified in this paper are almost similar from those with the case study in developed countries, our findings demonstrate two unique contributions.

First, the interviewees and FGD respondents mostly equate the indication of success with transparency. The nineteen (19) indicators of success are predominantly suggesting the improvement of transparency, such as reduction of corruption, financial transparency, or increase accessibility of data; and only very few indicating participation and none signifying collaboration. This finding confirms Sayogo, Pardo & Cook (2014) argument that the development of open government and open data in developing countries follows an incremental approach comparable to the e-government development stages. Plausibly, considering the resources, local government in developing countries directed their initial efforts to fulfill the need for transparency. Second, as identified from the description of challenges, public officials in local government behave differently with regard to their acceptance and support of open government and open data. Even with the encouragement from the leader and champion, the interviewees indicate the difficulties in changing the attitudes and mindsets of the public officials to accept the openness vision propagated by the Regent, especially at the lower level such as the villages and district level.

Subsequently, we present the anecdotal linkage between the challenges, critical success factors, strategy, and the indicators of success as shown in Figure 1 below. Critical success factors are vital for the strategy to be successful and they represent the drivers of the strategic plan (Boynton & Zmud, 1984; Parker Gates, 2010), it is valid to argue that facing the challenges, local government will enact strategic actions driven by the critical success factors (Figure 1). The strategies are aligned with the indicators of open government and open data success. Certain strategies are enacted to deal with particular challenges. For instance, the strategy in The Regency of Bojonegoro to create awareness campaign is enacted to confront the challenges of participation. On the other hand, a strategy does not automatically link to a performance or success indicator (Henri & Journeault, 2008). Thus, systematic evaluation is needed to ascertain the relationship between strategy and success.

This study also highlights major challenges in the implementation of open government and open data initiatives at local government level in developing countries, such as Indonesia. While the case amply demonstrates the efforts of local government to be more open and make more information available, several challenges emerged. Confirming to Dawes et al. (2004) and Dawes & Helbig (2010), the case indicates the diverse users' needs that challenge local governments in accommodating the different public interests and needs. In accordance to Klischewski & Scholl (2006), we also found that data management at the lowest level of government (at the village level) is lacking. The classical issues of disparity between the technological advancement and the development of regulation and policies governing the implementation and usage of data remain a barrier. The limited technological access and capability is also a challenge, particularly so for developing countries a disproportion of access due to geographic locations (Sayogo et al., 2014, 2015).

Figure 1. Connecting the challenges, factor success and strategy



Our results also indicate four primary lessons for the implementation of open government and open data at the local government level in developing countries, which include leaders' commitment, stakeholders' active participation, stakeholder's need from the start, and improvement of the personnel's capability through training and targeted recruitment processes.

5.2. Theoretical and Practical Implications

Our study focuses on open government and the supply side of open data, particularly in understanding the barriers and factors critical to achieving success on supplying data to the public. While studies on the supply side of openness have been criticized for overlooking the importance of data usage to induce overall success, more research into ways of dealing with the barriers is still needed (Janssen et al., 2012), particularly in developing countries. With respect to promising future research direction at the supply side, more investigations into the specific determinants of open government and open data success especially considering the impact of national contexts and government level are required. Our results indicate that public officials behave differently with regards to their acceptance and support of open government and open data. As such, better understanding of the attitudes and mindsets of public officials is invariably one of key determinants in shaping or constraining the implementation of open government and open data.

Yang et al. (2015) argue that open government and open data are closely related to interagency information sharing and integration. Our results demonstrate the challenges and barriers of conducting data sharing across different levels of government at the local level. While agencies at similar level might share similar policies and coordinating mechanisms, agencies at the lowest level are struggling to cope with the requirements from the higher levels. Further research is needed to better understand the interaction between open government and open data with interagency information sharing and integration. We propose preliminary set of indicators of open government and open data success

based on the subjective perceptions of the participants and interviewees. Further research is needed to formalize the development of the indicators of success for open government and open data. Extant studies argue for the non-existence of appropriate and formal metrics to evaluate success of openness initiative (Yang et al., 2015; Janssen et al., 2012; Bertot, McDermott & Smith, 2012)

As practical implication, our finding which indicate the different perceptions and attitudes of public officials with regards to the acceptance and support of open government and open data showcase the importance of training and education for public officials. Educating public officials about the importance of open government and open data as fundamental infrastructure of government governance is crucial (Yang et al., 2015). In addition, we propose a preliminary model connecting the challenges, critical success factors and strategies. Public officials could use the model to predict and make decisions on the appropriate technology and related success factors in implementing open government and open data.

6. CONCLUSION

In sum, our paper explores the complexity of open government and open data implementation from the perspective of a local government in a developing country. While some might argue that studies on the supply side of open government and open data might be superfluous, most of these studies were using cases from the developed countries. As such, we contribute in better understanding of the influence of national contexts in the implementation of open government and open data.

ACKNOWLEDGMENT

This work was partially supported by the Direktorat Jendral Penguatan Riset and Pengembangan (Ristekdikti) of the Republic of Indonesia under the Grant No. 28/E/KPT/2017. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the Ristekdikti.

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ENDNOTES

- ¹ Presidential Working Group for Supervision and Control for Development of Indonesia

Djoko Sigit Sayogo is a senior lecturer in the Department of Economics and Business at the University of Muhammadiyah at Malang (UMM), Indonesia. Additionally, he is the Vice Director of Research at UMM. His research interests focus on the intersection of information technology, public policy, management, and economic development and on the broad topic of the application of information technology both in public and private entities, including subjects such as information sharing in the financial market, open data, smart disclosure policies, e-financial reporting, and open budget.

Sri Budi Cantika Yuli is a senior lecturer in the Department of Economics and Business at the University of Muhammadiyah at Malang (UMM), Indonesia. Additionally, she is the Director for the Center for Sharia Economics and Finance at UMM.

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